

CLAIMS:

1. A control element having a rotary knob (4), having a magnetic circuit and having at least one coil (1),
characterized in that
the rotary knob (4) is supported so as to be rotatable with respect to at least a part of the magnetic circuit, the gap (5) between the rotary knob (4) and the magnetic circuit is filled with a magnetorheologic fluid, and the coil (1) is arranged to exert a variable braking action on the rotary knob (4).

2. A control element as claimed in claim 1,
characterized in that
the magnetic field in the magnetorheologic fluid extends in a radial direction.

3. A control element as claimed in claim 1,
characterized in that
a ring (8) of a hard magnetic material has been provided to keep metal particles contained in the magnetorheologic fluid away from the bearing and sealing area (10), and a further sealing element (12) has been provided to ensure that the suspension substance of the magnetorheologic fluid remains in the gap (5).

4. A control element as claimed in claim 1,
characterized in that
the ring (8) of a hard material, in conjunction with the sealing element (12) and the magnetorheologic fluid in the gap (5), is adapted to perform the function of a bearing.

5. A control element as claimed in claim 1,
characterized in that
the entire mechanical structure and the required sensors (14) are accommodated in the interior of the rotary knob (4).

6. A control element as claimed in claim 1,

characterized in that

the control element includes Hall sensors (14) and a sensor magnet wheel (13) for determining the position of the rotary knob (4) with respect to the stationary part of the magnetic circuit.

7. A control element as claimed in claim 1,

characterized in that

the rotary knob (4) is adapted to perform a push-button function in an axial direction of its shaft (6), and the Hall sensors (14) and the sensor magnet wheel (13) are arranged in the control element in such a manner that, in addition to the angular position, they can detect the push-button function of the rotary knob (4).

8. A control element as claimed in claim 1,

characterized in that

an electronic circuit for driving the coil (1) has been provided, which circuit energizes the coil (1).

9. A control element as claimed in claim 8,

characterized in that

the electronic circuit is adapted to simulate the impression of a mechanical stop in dependence on the angle of rotation of the rotary knob (4).

10. A control element as claimed in claim 8,

characterized in that

the electronic circuit is adapted to control latching functions and other braking functions in dependence on the angle of rotation of the rotary knob (4) and of the time.

11. A control element as claimed in claim 9,

characterized in that

the electronic circuit controls the rotary knob (4) in such a manner that also after forcible turning far beyond the simulated stop the braking action of the rotary knob (4) is cancelled immediately in the case of rotation in the opposite direction.

12. A control element as claimed in claim 8,
characterized in that
the control element is adapted to control a graphical user interface.
13. A control element as claimed in claim 8,
characterized in that
the control element is adapted to perform the functions of conventional controls on electrical
apparatuses.
14. A control element as claimed in claim 10,
characterized in that
the control element provides an additional feedback response in the form of synthesized
speech when a menu item on the graphical user interface is reached.